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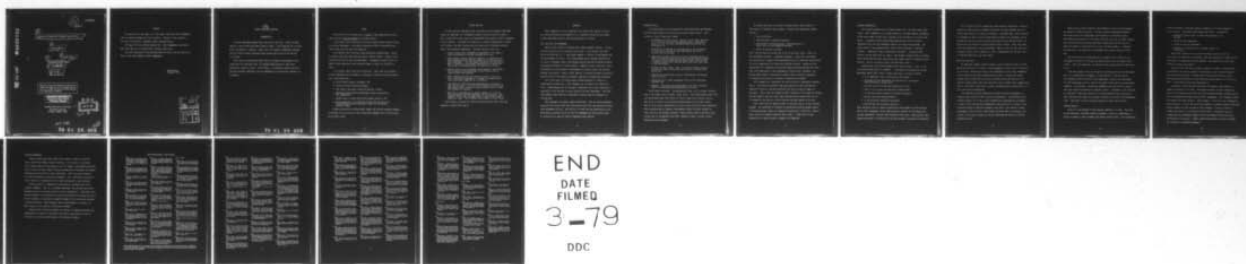
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Bruce F. Powers

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PREFACE

My objective for this paper is to tell CNA's staff what CNA's Management hopes to achieve through the staff's efforts. Because of that objective, the tone of the paper is normative rather than descriptive.

The paper was first drafted during 1976. CNA's Management contributed additional ideas to it during review of early drafts then.

The views expressed in this polished draft are mine, and not necessarily those of the other members of CNA's Management.

Bruce Powers
November 1978

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GOALS
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INTRODUCTION

The Navy Department spends about \$40 billion each year. There are many competing views on how that money should be spent. Each viewpoint has its advocates, and debate is vigorous. CNA's role is to conduct independent research that will help the Navy and Marine Corps decide what forces to buy and how to use them.

CNA's special contribution stems from its systematic measurement of the capabilities of existing forces, its growing understanding of what those capabilities imply for forces of the future, its freedom to pursue questions that CNA considers important, and its commitment to no particular viewpoint in the debate.

GOALS

CNA strives to do research that is useful to Navy Department decision-makers and that raises standards for defense studies.

To be useful, CNA's work must be directed toward choices actually faced by the Navy Department. CNA expends substantial effort to determine what those choices are and what they should be.

To be useful, CNA's work must avoid unnecessary complications. Doing so insures timeliness when decisions await research results. Doing so also conserves the time of busy decision-makers. Although CNA avoids frills, it employs those analytical tools and data needed to insure its research is sound.

To be useful, CNA's work must be objective. Many views are available to Navy Department decision-makers; disinterest in what the eventual choices are is rare among them.

To raise defense analysis standards, CNA:

- o Tackles the more difficult problems.
- o Does timely, pertinent, objective analysis of them.
- o Highlights unresolved Navy Department issues and questions Navy assumptions.
- o Spreads what it learns about doing defense analysis, and
- o Builds expertise in its analysts so that they can skip past the preliminaries and devote their effort to solving the problem at hand.

Achieving the goals of doing useful studies and raising standards depends on how CNA is set up to do its job, on how CNA's managers run its activities, and on CNA's staff.

DESIGN FOR CNA

To serve the Navy Department well, CNA must be close enough to know what issues are important, but independent enough to provide analytical advice that is unrelated to what some in the Department would prefer to hear in support of Navy programs. Achieving this balance in a research organization is difficult; however, the Navy contract with the University of Rochester provides some of the essential ingredients. The main contract points are:

- o Access to Navy policy documents is guaranteed. This makes a broad CNA perspective on Navy problems more likely.
- o CNA's annual research program is agreed to in advance by the Navy Department and by CNA, and cannot be altered except by mutual agreement. This encourages continuity and the development of expertise, and prevents termination of a study that shows signs of producing answers not desired by the Navy.
- o CNA may select up to 23 percent of the program. This permits CNA to develop a broad knowledge of naval warfare and to explore future Navy problems.
- o CNA's President controls the research process. This lets CNA's staff define problems as it thinks is appropriate and reach conclusions suggested by its analysis.
- o Navy funds for support of most CNA studies are provided in a lump sum each year. This allows CNA's managers to decide how much effort should be given to any particular project to meet CNA standards for quality.
- o When CNA is satisfied with a study's quality, it is distributed throughout the Navy Department, and even outside. Navy comments on the study are bound into it, but the Navy cannot suppress a study. This promotes useful debate on naval issues.

These features (unusual for contract research) permit CNA's staff and managers to pursue CNA's goals.

APPROACH

CNA's managers do so by assembling a very good staff, making it better by creating the proper environment for it, selecting interesting work aimed at Navy Department choices, and stressing quality of output.

THE STAFF AND ITS ENVIRONMENT

Most of CNA's staff is recruited from leading graduate schools. A career in naval analysis can run for many years at CNA -- some analysts have been here since World War II. A long tenure depends, of course, on performance and on replenishment of skills. Such replenishment occurs through opportunities to return to graduate school, and through internal education programs designed to broaden CNA analysts in naval analysis. Members of CNA's staff also strive individually to stay abreast of developments in military policy and relevant academic disciplines. Depth in naval analysis is achieved through the projects analysts work on and through a systematic approach to accumulating knowledge.

One of the traits of scientifically trained analysts is a desire to understand how things work. CNA's managers try to channel this inquisitive trait. Understanding for its own sake is important, but it must eventually be applicable to the problems of choice faced by the Navy Department. CNA seeks staff members whose interest in problems is greater than in techniques for solving them.

CNA's managers are usually chosen from within. They are given management responsibility because they have consistently done first-rate analysis and have shown management ability. Such ability is scarce and thus appropriately paid. Nevertheless, analysts who do not opt for management but show unusual depth or versatility as analysts achieve comparably high salaries.

RESEARCH TOPICS

Since good analysts are invigorated by interesting work, maintaining quality output depends on selecting interesting research topics. CNA's research is built around these themes:

- o Performance of today's fleet: how well it can fight, how much of it can reach a trouble spot quickly, what is required to keep it at sea, how newly introduced ships and aircraft are performing, etc.
- o Construction of mathematical descriptions of the performance of naval forces for use in other CNA studies and as predictive tools by the Navy.
- o Composition of naval forces to do a job, including the mix of ships, the weapon systems aboard them, and the required support for them: this can range from selecting a small force to find a submarine tomorrow to selecting what naval forces NATO needs in the next decade.
- o Missions of naval forces: what is the United States trying to achieve with them, and how well are they apt to achieve those objectives.
- o Economic and international political developments influencing naval decisions.
- o Developing ways to apply management tools to Navy Department problems, and
- o Manpower: attracting qualified people to the Navy and Marine Corps, training them and keeping the best of them.

These themes intertwine. The mainspring of CNA is its systematic measurement of the capabilities of today's naval forces. The understanding gained from such measurement makes CNA's advice on choices about how to operate forces, what forces to obtain, and personnel and maintenance policies more useful. Many of these choices depend partly on choices made outside the Navy Department -- monies appropriated by Congress, developments abroad, missions assigned to naval forces by the Defense Secretary. These external choices and their implications must be incorporated into CNA's research to make it useful to Navy Department decision-makers.

The themes take focus in specific research topics, which center on some aspect of a specific Navy problem. A typical Navy Department problem requires:

- o Clear definition.
- o Identification of possible solutions.
- o Exploration of the implications, including dollar or other costs, of each competing solution.
- o Choice of the best solution.

CNA's research projects provide any or all of the first three. Since the Navy Department has many -- sometimes competing -- objectives, clarifying the definition of a vaguely-perceived problem can be an important contribution. So can the suggestion of an additional possible solution. Seeing the true implications of a competing solution may require the understanding that stems from close observation of the performance of naval forces, personnel, etc. Casting implications in quantitative terms to permit objective comparison of alternative solutions is essential to sound decision-making.

CNA's managers are responsible for the selection of appropriate research topics. As experienced analysts they appreciate which naval problems are amenable to analysis, and which analyses are likely to have an impact on decisions. Their views are relayed to CNA's research staff by means of periodic internal reports that also stress what research CNA and others have set out to accomplish, the success of that research, and what remains to be done.

CNA's staff plays an important part in selecting topics for the research program. The usefulness of research in solving Navy problems depends partly on forecasting what issues are coming up for decision, or should be. Some of these issues are brought forward by CNA's staff -- a good staff is more effective if it works on what it judges to be important.

PROGRAM CONSTRUCTION

The research program tries to balance long-, mid-, and short-range naval issues. CNA's commitment to an annual program is a bulwark against consumption by the short-range concerns that claim most of the attention of Navy decision-makers. A program oriented toward understanding naval forces and their employment helps the Navy adequately address its longer-term problems. The agreed nature of the program permits CNA to work on problems it considers suitable -- important, timely, analytically tractable -- ones where CNA's analysis can and should have an impact. The program includes projects oriented toward particular decisions and projects that simply explore an important naval subject. The mix of projects varies with the Navy's needs.

Construction of an annual program occurs in three steps. First, a list of possible study topics is prepared. The topics are proposed by the Navy Department and by CNA's staff. Second, each topic is tested by asking:

- o Is it important? Who is interested in the answer?
- o How would the Navy Department be affected by its resolution?
Could substantial savings occur?
- o Does the topic cut across Navy bureaucratic lines?
- o Does it fit in with a CNA long-term research theme?
- o Is the issue readily handled by research techniques?
- o Has the issue been analyzed before?
- o Is the necessary information available?
- o Does CNA have the necessary expertise?

These questions lead to a menu of study topics that compete for CNA resources. Lastly, CNA's management, while negotiating the contents of the program with the Navy Department, allocates CNA resources to the topics. When projects show unexpected promise or difficulty as the year proceeds, allocations are modified.

The 23 percent of CNA's program not requiring Navy concurrence is used to examine new applications of academic disciplines to naval problems and to do studies whose success is especially uncertain. Sometimes CNA's senior analysts do contemplative work, trying to break knotty problems into manageable pieces. Although not anxious to rush in where others have failed, CNA may believe its capabilities can overcome a problem others couldn't handle. CNA's work tends toward new approaches to unsolved problems. When it turns out that analytical techniques cannot solve a problem, it still is highlighted for the Navy, and is sometimes made more clear than before.

WORK WITH THE FLEET

An important element of CNA's research, and an essential source of information for the rest of its work, is the assignment of about 1/4 of its analysts to the fleet. Analysts are assigned from Washington to help fleet commanders resolve problems faced while operating their forces. Helping with urgent problems where needed data are readily available allows CNA analysts to do pointed research under tight time constraints and to sharpen their communication skills. Such help to the fleet is direct, and appreciated; acquired skills are very useful back in Washington.

The knowledge of fleet capabilities brought back when assignments are completed adds realism to CNA's research in Washington. The Washington work includes another 1/4 of CNA's staff systematically examining the performance of today's fleet and preparing mathematical descriptions of it, based on data collected largely by analysts assigned to the fleet. This focus on current performance by half of CNA's staff permits the other half, by drawing on the results, to do useful research on choices concerning the future of the Navy and Marine Corps.

Ready access to data on how the fleet performs is one of the distinguishing features of CNA's activities. No other research organization combines such broad access with independence and disinterest in eventual choices. Performance data available to CNA ranges from data collected in combat through data collected during occasional peacetime interactions with the forces of potential enemies to data generated in tests the Navy conducts -- sometimes with CNA help. This immersion in performance data insures realism in CNA's work.

The realism of CNA's Washington work is enhanced still further by the assignment of analysts in the Navy and Marine Corps to CNA for regular tours of duty. They bring experience in operating forces along with their analytical skills.

Since CNA intends to deliver research of uniform quality to the Navy wherever it is accomplished, assignment of CNA analysts to the fleet places extra demands on their initiative and independence, because the arrangements for CNA's Washington projects often do not apply to the staff of an operational commander. In particular, operational commanders are more likely to request that they control distribution of research results. Furthermore, fleet analysts are expected to show more initiative in starting projects and in uncovering data, and their work cannot be reviewed as readily as the work of the Washington staff. CNA sends its more experienced analysts to work with the fleet.

INSURING QUALITY

Quality is the hallmark of CNA research, wherever it is done. Since CNA prizes usefulness, including technical soundness, as well as independence, a variety of means is used to enhance the quality of CNA's work. The time-honored

university method of insuring technical soundness is to allow standards to be set by peers. CNA employs that method, and others. Included are:

- o Exposure of project work to other CNA researchers as it proceeds.
- o Review by CNA's management.
- o Review by the Navy Department.
- o Exposure of finished work to a broader audience of researchers.

Within CNA, seminars for the staff on research projects stress the description and formulation of problems, analytical approaches to them, and the availability of appropriate data and methods. They purposely air the difficulties in solving the problem.

After projects have been concluded, reports are formally published and distributed to as wide an audience of researchers as the classified nature of most of CNA's work permits. Knowing that written research results will be distributed beyond the Navy to other researchers adds impetus to do first-rate work -- professional reputations depend upon it.

In addition to that personal motivation, CNA employs other methods to enhance the quality of its work. CNA imposes academic research standards on itself as an institution, but does this while avoiding academic-sounding reports. This is accomplished through review by CNA's management. CNA's managers attend the seminars as senior analysts. Other seminars -- the first step in managerial quality control -- stress the use of CNA resources to complete studies efficiently. Written studies are also reviewed by CNA's managers. (A study's quality is seldom clear until it is reviewed in written form.) Preliminary review is accomplished by intermediate managers who do not forward written work until satisfied with its quality. Studies judged unsatisfactory by CNA's President are returned to intermediate managers.

When CNA's work is at its best, it helps to set standards in the defense research community.

TIMELINESS

Each project in the annual research program begins with a deadline. Project deadlines are sometimes fixed by the Navy Department's need to meet a deadline set by Congress or the Secretary of Defense. More often, project deadlines are set after negotiations in which CNA estimates the resources required to complete the work successfully. Once a project deadline has been set, CNA is obligated to meet it. Despite CNA's emphasis on real issues with their attendant demands for timeliness, principal emphasis remains on thorough and high-quality work. Because the course of research is hard to predict when a project begins, proposals to the Navy Department to push back deadlines are sometimes made once work is underway. CNA's lump sum funding permits assignment of additional resources to a project if the issue can be resolved by doing so. Such resources are assigned when warranted and when the deadline is not imposed from outside the Navy Department.

CLIENT RELATIONS

The tendency for CNA's studies to cut across bureaucratic lines and CNA's access to all levels of the Navy Department make CNA a communications link between parts of the Department. (That role and CNA's library of policy documents, past studies and reports of naval exercises provide some of the Department's corporate memory.)

CNA's annual program in Washington is occasionally interrupted to provide short-term help. Much of CNA's impact in Washington comes from such efforts, which normally draw on expertise developed by the long-term program. Short deadlines require analysts to focus on what is essential to pending Navy

decisions. Short-term work also builds enthusiasm among CNA's staff for the annual program because it sharpens understanding of issues and makes it clear that CNA's results are used. Furthermore, Navy Department officers who see members of CNA's staff perform under short-term pressure develop confidence in them. The officers then pay more attention to long-term CNA work. CNA considers requests for short-term work carefully, rejecting those where CNA has nothing unique to offer.

Occasionally, CNA's reports are not widely distributed. From the Navy's viewpoint, wide dissemination of results can short-circuit the normal decision process. On such occasions, the Navy may request CNA help on an issue of central importance under the proviso that results be privileged. CNA honors these requests when it can be helpful and when it is likely that research results will eventually be published.

An organization that exercises its independence can breed tension in a large bureaucracy. Tension exists between some Navy Department officers and CNA, for two reasons. First, there sometimes is disagreement between CNA and the Navy about when the proviso is appropriate. Second, the Navy Department is diverse (it includes fleet commanders, force planners, equipment developers, and laboratories) and not of one mind; views about the value of a particular analysis differ. These varying views, expressed as the analysis proceeds, tend to improve its quality and its relevance.

CNA's staff is sometimes called upon to persuade Navy Department officers of the value of analysis in treating a particular problem. Resistance may stem from concern about CNA's independence or from unfamiliarity with what CNA studies do. The communication skills of CNA's staff are called upon on such occasions, as well as when delivering research results.

BUILDING EXPERTISE

There are many ways other than work on specific issues to build an expert staff that produces quality research. One of these is to produce and to update books on naval analysis (on, for example, antisubmarine warfare). Books are part of CNA's output; CNA also systematically catalogues and expands mathematical descriptions of naval operations. CNA's research techniques are often published in professional journals. Also, nontechnical writing on naval subjects is encouraged so as to reach and educate a large audience.

Research quality is enhanced by wide contacts, including ties to the academic community. One tie is through consultants, who provide specialized knowledge such as the current state of various technologies. Consultants also provide stimulus to the CNA staff to acquire and maintain new analytical skills. Another stimulus is a program of speakers brought to CNA to describe problems of general interest. These speakers focus on developments in science, on public policy, or on analysis of non-naval problems.

Deepening CNA's expertise enhances its ability to combine usefulness and independence in studies for those who face choices regarding naval forces. The ability to turn out such studies is not matched elsewhere.

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